THE TREATMENT

OF

FRACTURE OF THE FEMUR.

BY

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MEMBER OF THE MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND AND BALTIMORE MEDICAL ASSOCIATION, AND ST. LOUIS MEDICAL SOCIETY, FORMERLY ASST. SURGEON TO WEST BUILDING HOSPITAL, BALTIMORE, MD., AND LATE U. S VOL.

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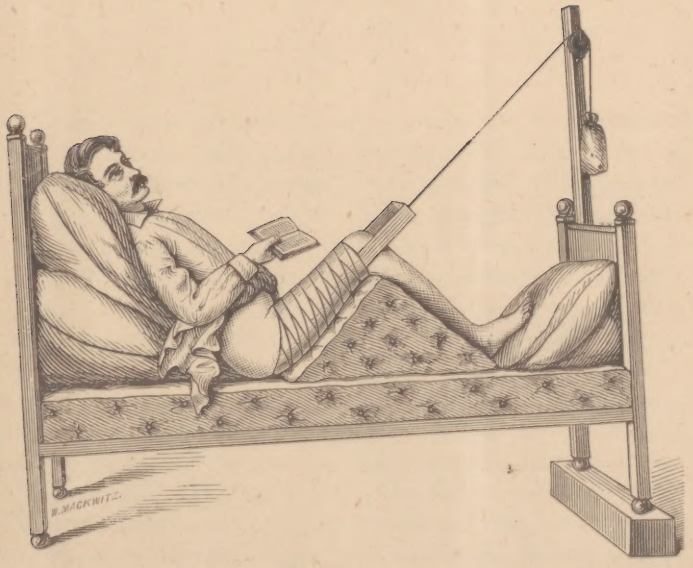

Dr. Edw. Borck's Method of Treating Fracture of the Femur.

The Treatment of Fracture of the Femur.

We possess many apparatuses and contrivances for fracture of the femur, and while there are so many it shows that none are as yet perfect. Each of them has advantages and disadvantages more or less; but I think, that of all, the straight splints are the least useful and are unnatural. Look at all the long splints—Munger's, Walton's, Liston's, Physick's, Desault's, Hodge's and Gilbert's apparatus, and many more, there is not one that is comfortable to the patient. They all look more like torture machines.

Morgan's fracture bed, Swinburrie's method, and Buck's apparatus are preferable to the long splints; they all aim at keeping the limb *straight* and preventing shortening by extension and counter extension. The patient is kept flat on his back, shoulders low, perineal band extension by the foot and leg in various ways. The knee can only bear from fifteen to twenty pounds of extension weight by the leg, hardly enough to overcome the rigidity of the muscles of the thigh, while the bandages upon the leg and foot will irritate the skin; the perineal band will also produce irritation; still this may be mitigated by substituting adhesive strips. Nevertheless, see what an amount of stretching has to be done.

Fractures of the femur are mostly oblique, and occur most frequently in the upper fourth of the shaft, next, in the lower fourth.

In the first, the displacement of the upper fragment is due to the combined action of the psoas and iliac muscles, perhaps aided by the pectineal and short head of the abductors, and outwards by the external rotators. The lower fragment is drawn up by the flexors of the thigh and outwards by the tensor, vastus and

gluteal muscles, and then you have deformity and angularity. Now the object is to keep the fragments as nearly as possible in their natural positions, and thereby obtain the least possible shortening. All surgical writers guard us against shortening and other defects, and recommend the use of compresses, splints, bandages, etc. Dr. F. H. Hamilton says the best coaptation of the fractured ends of the bone, aided by overcoming the contractile resistance of the muscles, is all that can be accomplished. There will always be some shortening in these fractures. Now, if we can acomplish what Dr. Hamilton says, or as near as possible to it, we do well. But can the fractured ends be kept in coaptation by the long splint? Can the contractile resistance of the muscles be overcome by keeping the patient in a dorsal position, with the limbs straight, the shoulders low, while at the same time employing traction? I think not, for it is not the best position to relax such powerful muscles as those of the thigh, and in particular not for those that do the most mischief towards producing the deformity. The tonicity of the muscles can not be overcome by employing heavy weights and strong pulleys; they are only more irritated by that procedure. Spasms are produced in addition. You may tire them out in time, but the patient will be tired out also. I have never seen any patient comfortable with the long splint. To produce relaxation and coaptation we want a position as near as possible to the natural one, and position is the double inclined plane.

Now, anybody can try for himself. Let him lay down flat on his back with his legs stretched out for one to three hours, and he will see and feel what a hard work it is to keep in such a position. But you feel immediately relieved by flexing your legs and raising your body into a semi-inclined position. Try it and you can at once sit thus for hours, without becoming tired. Why? Because your muscles are relaxed and are at ease. By flexing the leg, you relax the biceps, semi-tendinosus, and semi-membranosus. You next have to overcome the rigidity and action of the psoas and iliacus muscles. Here you have a double action to overcome. When these muscles act from above, they flex the thigh upon the pelvis naturally, and rotate the femur outward. If they act from below, the femur being fixed, these muscles bend the lumbar portion of the spine and pelvis for-

wards naturally. I do not see how this double action can be overcome by keeping the body and legs straight. The semi-inclined position of the body and flexion of the leg, seem to me to be the nearest to a natural position, and the most likely to overcome the difficulty under consideratian.

I know well that when a bone is fractured, the muscles will contract, but I also know that they will relax completely if left alone, when put in an easy position. It may also be said that while the tension of one set of muscles is taken off by this position, it necessarily increases that of another or an opposite set. It is true, but the double inclined position reduces this evil to a minimum. The double inclined position is also preferable in fracture of the femur immediately above the knee-joint, for here the gastrocnemius muscle drags the lower fragment backwards into the poplitial space, and this you can only overcome by flexing the leg. All the straight splints and pulleys will do no good. This is admitted even by distinguished surgeons who do not employ this method.

I think, that, in the treatment of fracture of the femur, the long, straight splint is inconsistent and unnatural, and does not fulfill the purpose at all; that by the use of them deformities and shortening must necessarily be produced. I believe that any fractured femur, treated with Physick's or Desaults's long splint can be instantly recognized post mortem by the way union has taken place, the upper fragment pulled upward and a little outward, the upper end off the lower fragment pushed inward, the newly formed callus uniting them obliquely, if the fracture has been in the upper fourth of the shaft; and why? Because the body and leg have been kept straight and the femur is not straight, not perpendicular. Take the body standing erect, the heels close together; then draw a perpendicular line from the umbilicus down between the two heels; also a line from the axilla, on both sides down, perpendicular, and across the line below and above, to form an oblong square. Say the transverse line from axilla to axilla measures eighteen inches; the transverse line below the feet also eighteen inches, nine inches on each side from the line drawn down from the umbilicus; take this position as the natural one, the arms pending; then look at the femur. Is it perpendicular or is it oblique? A line drawn

from the great trochantor to the internal condyle, runs from above downward and inward. The internal condyle is, therefore, longer than the external one, to make up the plane, straighten the lower leg, and bring the knee-joints together near the line of gravity to the body; the femur is not and does not hang perpendicular from its socket. If it did, our legs would be apart, instead of together, in the erect posture. Now, if the long splint is applied from the axilla perpendicularly down below the foot, the body will not touch the board anywhere except in the axilla. It will be two or three inches away from the crest of the pelvis, and about six or seven inches from the foot; the foot is pulled towards the board and the limb bandaged, the intervening spaces filled up with cotton; in a great many cases the limb is still dragged more outward; this acting as a lever must necessarily push the upper end of the lower fragment of the femur inward beyond its natural line. If, instead of pulling the foot or heel six or seven inches, or more, towards the board, the foot should be left in its natural place, and this space filled up by some soft material, it might answer a better purpose to keep the femur in its natural position.

To get a good result in any fracture, it is necessary to keep the bone as nearly in its *natural* position as possible, so that the femur may be kept in its natural position. But, if you expect to keep the femur straight, in the actual sense of the word, by a straight splint, you will certainly be deceived. It will be crooked. This is what we should avoid, and we can only do it by the double inclined plane apparatus. The word "*straight*" has misled many and will mislead more.

My method of treating those fractures is simple: To put the patient on a firm mattrass; to elevate the foot of the bed three or four inches; the shoulders also elevated, even as much as the semi-sitting posture; the fractured thigh upon a douple-inclined, firm, yet soft, pillow, the foot against a board or pillow; the body and the leg will make all extension and counter extension needed. The pillow must be made to fit and suit the individual case.

I have treated cases, particularly in some old persons, with this simple means with success and ease to the patient. Sometimes, if necessary, I put, in a day or two, an ahesive strip about two

and a half or three inches wide, along the inside of the thigh, below the fracture, forming a loop at the knee and run it up on the outside; the same as done and used at the foot; apply another piece of plaster or a bandage around the thigh, to keep the first in its place.

I fasten a post at the foot of the bedstead, not opposite the foot of the injured limb. If it is the right leg, I put it a little to the left of the median line from the umbilicus. A roller is fixed into the post, a cord fastened to the loop, which extends from the knee, and running over the pulley in an oblique direction; the cord must pass on the inside of the great toe; a weight hung to this of five or ten pounds, and increased if needed; or, simply tie the cord to the post. Here the extension, if wanted, is direct from the thigh, and a great deal more force can be employed than from the leg, but, in general, it is not wanted. If the patient is very restless, I employ splints of wood or reed, one-half to three-quarters of an inch wide, and the proper length, glued to strong cloth, properly and accurately fitted and buckled or pinned; that is all. One anterior and two side splints of felt or leather would answer. I dispense with the perineal band altogether. This is, in my experience and opinion, the best mode of treating fracture of the femur. Next to this, I should prefer Hodgen's or Smith's wire splint, which I often employ, or any other double-inclined apparatus in preference to the long splint. Even for fracture of the neck of the femur, this mode will answer better.

I do not claim anything original in regard to this treatment, nor perfection. All I claim is, that the double-inclined apparatus is the more natural one, and that I use the extension if any is needed from the thigh direct, keeping the femur in as natural a position as possible.

I may, in conclusion, mention that the reason why Profs. John T. Hodgen and N. R. Smith attain such good results with their suspension splints, is simply due to the more natural position they keep the limb in, and the patient does not get tired out so easily.

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